Bertrand Russell on Logical Constructions: Matter as a Logical Construction from Sense-data

Abstract. The notion of logical construction was used by Bertrand Russell in the early 20th century, which originally comes from A. N. Whitehead. Russell said that matter as a mind-independent thing can only be known by description. He also argued that matter is a logical construction of sense-data. However, this leads to an incoherent view of the direct or indirect connection between a mind and the external world. The problem examining is whether a collapsing house is a logical construction of the sense-data of rumbling sounds and collapsing shapes. Using Russell's writings between 1911 and 1918, I will analyze how Russell characterized logical constructions. Finally, I will show Russell's view about the relation of logical constructions to matter and sense-data. A careful interpretation of Russell's thoughts shows that the contents of the statements of the physical world are not constructions being equivalent to the contents of the sense-datum statements.

Keywords. logical construction, sense-datum, matter, acquaintance, perceptual experience

1. Introduction

One belief about Bertrand Russell's sense-datum theory of perception is that the statements concerning the physical world are constructed of sense-data. In this article, I will show that this belief is not plausible in the sense that physical things could be explained in the terms of the immediate objects of sense experience. A logical construction can be characterized in such a way that As are logical constructions from Bs when As can be reduced to Bs, i.e. As can be said in a more fundamental way in terms of Bs. For example, phenomenalism means that matter is a logical construction out of experience. The "logical construction of sense-data", however, does not mean in Russell's theory that the contents of the sense-datum statements are also the contents of the statements of the physical world. Contemporary philosophers make the mistake of claiming that Russell's statement "Matter is a logical construction of sense-data" would refer to the philosophical theory of perception of direct realism (Landini, 2010**;** Linsky, 2019; Miah, 1987; Miah, 2006). Sense-data are successors to

the empiricists' concepts of ideas of sense that were introduced by Bertrand Russell and G. E. Moore in the early twentieth century. The sense-data are immediate objects of perceptual experience, such as color patches, sounds, and tastes. (Goldman, 1992, p. 475) But even if the concept of sense-datum is known in Russell's philosophy, the concept of logical construction is not so known.

For Russell, the concept of logical construction meant "incomplete symbol". As an entity, by contrast, it was the "logical fiction". (Linsky, 2019) Examples about the entities, which describe logical constructions vaguely, are numbers that are constructed from sets, matter from sense-data, time from events, and space from volumes (Jager, 1972, p. 296). Furthermore, when examining Russell's work *Our Knowledge of the External World*, it does not explain how he understood the concept of logical construction. He just mentions constructions in the preface and lecture IV. (Russell, 1913b) Secondly, Russell's principle of scientific philosophy suggested that the *inferred* entities must be substituted for *constructions* that are logically derived from *known* entities (Russell, 1914, p. 11). He thought that the sense-data are dependent upon the brain and the sense organs before 1921. However, Russell abandoned the sense-data from his theory of perception in *The Analysis of Mind*, in 1921: the sense-data would be contained in the experience.

Russell thoughts seem to lead to a problem that a perceiver, who has an experience of some entity, cannot be in the direct *and* indirect connection to the external world simultaneously, such as to the lawn, which is outside of the perceiver's mind. We must remember that Russell's principle of scientific philosophy is connected to his statement about what we know by acquaintance and what we know by descriptions. According to some philosophers, Russell's view meant that if external physical entities can be reduced to sense-data, then external physical entities can be constructed out of sense-data. Otherwise, we *indirectly* know the existence of external physical entities by inferring them from the internal content of perceptual experience. (Bode, 1918; Klein, 2017; Linsky, 2019; Miah, 1987; Miah, 2006; Schwerin, 2017; Steen, 2004; Taylor, 1993) However, I will argue that if the perceiver's properties are preconditions for the sense-data, then this fact is sufficient to disprove the identity between the sense-data and the external physical entities because they have different properties, such as different locations. No object can have contrary properties. Russell never claimed that the sense-data are identical to the external physical entities.

This article discusses the relationship between logical constructions and the known and inferred entities will be examined. The problem I will examine is the following: is the collapsing house a logical construction out of the sense-data of rumbling sounds and collapsing shapes? This issue is of utmost importance, not only in philosophy but also in science, because it is not clear whether the world is *directly* exposed to our experience. According to Russell, sense-data, such as certain patches of color or sounds, must have correlation with external physical things, for example, with mole-

cules having no color or atoms making no noise. These correlated entities, which are sense-data and physical entities, must be constantly found together. However, saw Russell, only the perceived object, that is the sense-datum, is ever found. (Russell, 1914) In the following pages, firstly, I will analyze how Russell characterized logical constructions. I will then present Russell's view about the relation of logical constructions to matter and sense-data. Russell's thoughts show that, and there are many reasons to believe this, his view is not an identity between a sense-datum and the external physical thing, or that the content of the concept of sense-datum and the content of the concept of logical construction would be the same. Finally, I will argue that the place of sense-data to exist is in the perceiver according to Russell's explanations, and, moreover, my argument must be plausible because contrary properties cannot coincide in one and the same thing. The conclusion is that the sense-data and the external physical thing are not identical and reducible to each other in Russell's sense-datum theory of perception and, therefore, the contents of the statements of the physical world are not constructions being *equivalent to* the contents of the sense-datum statements.

2. The Logical Constructions in Russell's Theory of Matter

In this section, I will examine what Russell meant by logical constructions. It seems that, in Russell's thoughts, the logical constructions resemble abstract expressions derived logically from the immediate objects of present experiences. At the same time, to my mind, known things cannot be substituted for the logical constructions, which correspond with the supposed inferred things, but the logical constructions can be substituted for the supposed inferred things; matter is a logical construction of sense-data, as an example. In the 1910s, Russell argued the *known* things are sense-data, which are particulars immediately perceived, like certain patches of color or certain sounds, as contrasted with universal qualities. The supposed inferred things are physical external things. What a logical construction is is not so clear. It seems to me that a physical external object, such as matter, cannot be said more fundamentally by the expressions of sense-data in Russell's theory. In this section, therefore, our goal is to explicate the concept of logical construction.

Russell's supreme maxim in scientific philosophizing is this: "Wherever possible, logical constructions are to be substituted for inferred entities" (Russell, 1914, p. 11). However, what are these logical constructions?[1] It may resemble a function, i.e. an incomplete symbol, like "x + 2", which

[1] Many previous studies about Russell's view of logical constructions did not clearly attain the function of constructions in Russell's theory of sense-data. See for example Wisdom, 1931; Irvine, 1999; Grayling, 2003; Nasim, 2012; Linsky, 2013; Linsky, 2019. I consider that the most useful study is Jager, 1972.

substitutes constructions for the supposed inferred entities, such as external physical things “sun”, “cat”, or “house”. However, and there is evidence for this, I assume that Russell might also have in mind the ordinary thing concepts that can be about the known sensory objects, or about the sense-data. Logical constructions are like descriptive nouns because they can be to be substituted for inferred entities and be about known entities, which are acquainted with us. For example, said Russell, the inferred entities behind sense-data correspond with logical constructions, such as matter, physical things, and time, are logically constructed from sensory objects, which are properties, like from a color, a shape, or a noise. As an example, an inferred entity is matter because, according to Russell, the perceiver is not directly acquainted with or aware of the physical things of the external world. Russell's writings, without question, support the above interpretations. His one description of the method is the following one:

> Given a set of propositions nominally dealing with the supposed inferred entities, we observe the properties which are required of the supposed entities in order to make these propositions true. By dint of a little logical ingenuity, we then construct some logical function of less hypothetical entities which has the requisite properties. This constructed function we substitute for the supposed inferred entities, and thereby obtain a new and less doubtful interpretation of the body of propositions in question. (Russell, 1914, p. 12)

This method gives us two different sets of propositions: the body of propositions in question, and the propositions of the constructed function. Russell’s another example is the sense-data (less hypothetical entities) as functions about physical things (the supposed external entities): “When such-and-such waves impinge upon the eyes, we see such-and-such colors, and so on” (Russell, 1914, p. 5). Thus, for example, which is a clarification, we would have a proposition about the physical reality “These physical things are red and round”, the physical things as the supposed inferred entities, a logical function “xs are tomatoes”, these less hypothetical entities of appearing redness and roundness, and a new and less doubtful proposition “Tomatoes are red and round”. If xs are these physical things, then we obtain a proposition “These tomatoes are red and round”. Here, the logical construction is a notion “tomatoes” logically derived from sensory phenomena of redness and roundness—from sensory phenomena, it would thus not been *inferred* the supposed external entities as Russell thought in 1912 (Russell, 1912b). The logical construction is not the same as these sense-data, and the supposed inferred the physical things cannot be reduced to these sense-data.

I consider the above consequence plausible because, for Russell, the logical construction seems to be an “empirical thing concept” for which the sense-data concepts, for example, “such-and-such colors and shapes”, are suitable. Thus, this logical construction concept is in a logical connection

with another sense-datum concept. However, the *reference* of a logical construction, say "quantum waves" or "light", does not make the logical construction true because the logical construction is derived from sense-data. Instead, the empirical or acquainted sense-datum "such-and-such color" is the truth-maker of the logical construction. Russell did not consider these three entities identical or exactly alike, that is sense-data, logical constructions, and the supposed inferred entities. They are not interchangeable in the same proposition *salva veritate*. For example, the perceiver is in the acquainted-relation to the sense-datum of dazzling light color because he or she is immediately aware of the dazzling light color. According to Russell, this color sense-datum is dependent on the sense-organs and the brain. However, the perceiver is not in the acquainted relation to quantum waves and, furthermore, quantum waves are not dependent on the perceiver's properties. Therefore, the perceiver is not immediately aware of quantum waves when we follow Russell's distinction between knowledge by acquaintance and knowledge by description. The logical construction is therefore not a sense-datum, but a logical construction is derived from sense-data. If a logical construction means reducibility, then a physical external object is not reducible to sense-data that are features.

Russell's ideas about logical constructions are unfortunately ambiguous as he did not use singular statements but general statements about logical constructions. As I mentioned above, his methodological principle, for example, is in the general form in his article *The Relation of Sense-data to Physics*: "Wherever possible, logical constructions are to be substituted for inferred entities." (Russell, 1914, p. 11) Russell's idea started from a recognition. Many concepts are unclear and puzzling:

> The most important part, to my mind, consists in criticizing and clarifying notions which are apt to be regarded as fundamental and accepted uncritically. As instances I might mention mind, matter, consciousness, knowledge, experience, causality, will, time, and the like. I believe all these notions to be inexact and approximate, essentially infected with vagueness, incapable of forming part of any exact science. (Russell, 1924, pp. 147–148)

These inexact concepts should be explained by sense-datum concepts that are not vague. I understand that the "clear" concepts, or most of them, are empirical: one is immediately aware of their referents, of their sense-data. These inexact concepts, by contrast, like "mind", "matter", "time", and "experience", are logical constructions derived from sensory phenomena. Therefore, we have reasons to believe that some of these cases—the exact concepts—would be a more fundamental way of expressing inaccurate expressions, such as external matter.

According to Russell, the logical construction for all members of the *known* entity is true if a statement of the *unknown* inferred entity is true because, perhaps, they are exactly alike. This is rea-

son why the logical constructions should be substituted for the unknown entity, which is real nonetheless, even though, said Russell, the constructions are *fictions* as entities. *Inferred* entities are, for example, the physical reality and other minds, *constructions* are both functions and incomplete symbols like a function "x + 2" or, as I suggest, the ordinary thing concepts like "tomato", and *less hypothetical entities* are sense-data. Matter as an inferred entity *is similar to* those entities whose existence is given to the senses through inference (Russell, 1914, p. 12). Russell states that "the method which substitutes constructions for inferences would exhibit matter wholly in terms of sense-data" (Russell, 1914, p. 12). Let us consider an example. One thing should not be logically inferred from another. Rather, to define one thing as another thing *by constructing one thing* logically by means of another thing, such as a material house by means of sense-data or time duration by means of events. For example, matter is constructed in terms of sense-data—it is not deduced as a supposed entity from sense-data—in the similar way as defining the cardinal number of a given collections as the class of all equally numerous collections. Because the direct detection of matter remains doubtful for Russell, that is a reason for logically constructing matter. (Russell, 1914, p. 11) However, it is not justified to add the identity between matter and sense-data in Russell's theory of sense-data because then logical construction is not needed. Furthermore, the appearance of the material thing can be altered whereas simultaneously the material things remain constant. It is not just the way to perceive these changes, when the observer senses, but also a substance-like object of senses changes, which the observer senses directly. The external entities do not change in this case. (Russell, 1912b, pp. 2–3) The identity cannot be added, if atoms or molecules have no colors, and some sense-data are certain patches of color caused by the perceiver's properties (Russell, 1914, p. 5). The sources of Russell's thoughts also support such an interpretation.

Matter is *not* the class of its appearances, but a construction derived logically from appearances without matter being reduced to appearances—matter as supposed entity would be behind the appearances. The following statement must be based on Russell's *reasoning*:

> The appearance of a thing in a given perspective is a function of the matter composing the thing and of the intervening matter. The appearance of a thing is altered by intervening smoke or mist, by blue spectacles or by alterations in the sense-organs or nerves of the percipient. (Russell, 1914, p. 17)

This reasoning really means that there is no identity between the appearance and the real thing. (Russell, 1914, pp. 20, 21, 22). There are probably causal connections between them. Dreams, illusions, and hallucinations lack these causal connections. The lack of causal connections is a reason why dreams, illusions, and hallucinations differ from normal sense-data. (Russell, 1914, pp. 24, 25,

26) However, the cause-and-effect relationship implies that sense-data concepts do not mean the same as physical object concepts. Physical object concepts are thus not better explained by sense-data concepts. The sense-data, said Russell, are *not* to be substituted for inferred entities but logical constructions are to be substituted. The sense-datum concept deals with the sense-datum, and the logical construction with a supposed physical thing.

I do not believe that Russell's method of the "scientific philosophy" leads to the knowledge of the ultimate nature of reality. Russell did not know the nature of matter, time or other minds by means of a construction from the sensory objects. In the next section, I will analyze Russell's view of the relationship between matter and sense-data, but I am also going to ask where the constructions are placed between matter and sense-data.

3. Bertrand Russell's Claim that Matter Is a Logical Construction of Sense-data

Bertrand Russell presented the influential idea in the 1910s: we are immediately aware of the perceiver-dependent sense-data. We found that the content of the concept of sense-data and the content of the concept of logical construction cannot be identical in Russell's theory. In this case, we would not know or be acquainted with matter as a supposed inferred entity of the external world through perceptual experience but through descriptions. Russell, in fact, did not question whether the world of material objects exists, but he believed that matter itself is not directly perceived. In this section, I will focus on the relationship between sense-data and physical things in the external world and ask what a logical construction is between these sense-data and the supposed inferred entities of the external world. This relationship is connected to his statement about what we know by acquaintance and what we know by descriptions. That is to say, whatever else may be doubtful, yet some at least of our immediate experiences seem certain, argued Russell, but external physical things are doubtful to perceive directly (Russell, 1912b, pp. 7–9). Let us first concentrate on the sense-data so that we know what the sense-data concepts are in Russell's theory.

Russell considered sense-data as *physical* subjective particulars (Russell, 1914, pp. 8, 10), which are like substances since they never appear as predicates or relations in propositions (Russell, 1911a, p. 133). In 1911, he argued that sense-data exist only when they are perceived. Therefore, the physical world is not identical with the "world" as it seems to be, and we believe there is a physical world only for inductive reasons. (Russell, 1911a, pp. 133, 136; 1912b, pp. 2, 11, 83; 1913a, pp. 187, 188) Russell's inference that sense-data are subjective "in so far as their existence depends partly on us" (Russell, 1911a, p. 136; 1913a, pp. 187, 188) is correct only if there are sense-data.

Russell, of course, argued that the external physical things do not depend on us, not even partly. The sense-data, however, depend upon the relations between us and the supposed physical entities. Furthermore, according to Russell, an external physical thing is not identical to the sense-data. (Russell, 1912b, pp. 3, 4, 6, 11) Russell developed the idea that we know the objects of sense by the "acquaintance" relation, but we do not have the same knowledge of physical entities such as of trees and houses.

In his *Knowledge by Acquaintance and Knowledge by Description*, Russell presented the cognitive relation "acquaintance". He said that I am acquainted with an object when I have a direct cognitive relation to that object, i.e., when I am directly aware of the object itself. (Russell, 1911b, p. 148; 1913a, p. 184) Concerning the issue of subject, he argued that "I prefer the word acquaintance, because it emphasizes the need of the subject which is acquainted" (Russell, 1911b, p. 148). Russell gave the examples of a color or a noise: when I see a color or hear a noise, I have a direct acquaintance with the color or the noise (Russell, 1911b, pp. 148, 149; 1913a, p. 184). The sense-data, such as the color and the noise, are the direct objects of perceptual experience (Russell, 1911b, p. 149). But physical external things (as opposed to sense-data) and other people's minds are not included among the objects with which we are acquainted (Russell, 1911b, p. 151). However, I have a perceptual reason to believe that I am not aware of the relation of *difference* or *resemblance* between sense-data and physical things. One problem, which seems to be clear, is that how I discover that the object of perception that I have a direct acquaintance with *is* a mind-dependent appearance and *is not* an external physical object. Russell's one argument expresses that "whenever a relation of supposing or judging occurs, the terms to which the supposing or judging mind related by the relation of supposing or judging must be terms with which the mind in question is acquainted" (Russell, 1911b, p. 155). For example, I am aware of or acquainted with a noise when perceiving and then I make a statement about the noise. I must know what it is about which I make a statement. But do I discover that the noise is an *internal mind-dependent* sense-datum? Russell might answer that I only have descriptive knowledge of a substance, of matter, when I immediately spot and become aware of the noise having some properties with which I am acquainted. If you ask me, knowledge by acquaintance does not include the properties "inner" and "mind-dependent", or "outer" and "mind-independent" because they are not sense-data. (Russell, 1911b, p. 161) In such cases, Russell had another source of information: knowledge by description.

All the information, said Russell, is based on two sources, which means that immediate direct information about the world of physical things or other minds would not exist. Russell writes in his posthumously published work as follows:

> All the knowledge we possess as to what exists rests upon two kinds of foundations: (1) immediate acquaintance, which assures us of the existence of thoughts and feelings and sense-data, both those which we have at the moment and those which we remember; (2) general principles, according to which the existence of one thing can be inferred from that of another. (Russell, 1912a, p. 80)

He means that things that are not immediately known are deduced from what is known immediately, or from thoughts, feelings, and objects of sense. They are deduced by means of general logical and metaphysical principles. Later, logical constructions have replaced this inference thesis in Russell's theory: from one thing one does not infer another thing, but one thing is logically derived from another thing and explained by means of this. From the sense-data we do not infer physical things behind them, but the physical things are logically constructed of sense-data. Knowledge by description, however, means as follows:

> We shall say that an object is 'known by description' when we know that it is 'the so-and-so', i.e. when we know that there is one object, and no more, having certain property; and it will be generally be implied that we do have knowledge of the same object by acquaintance. We know that the man with the iron mask existed, and many propositions are known about him; but we do not know who he was. (Russell, 1912b, p. 29)

Russell, in fact, argued that our knowledge of the thing *table* is knowledge by description:

> My knowledge of the table is of the kind which we shall call 'knowledge by description'. The table is 'the physical object which causes such-and-such sense-data'. This *describes* the table by means of the sense-data. In order to know anything at all about the table, we must know truths connecting it with things with which we have acquaintance: we must know that 'such-and-such sense-data are caused by a physical object'. There is no state of mind in which we are directly aware of the table; all our knowledge of the table is really knowledge of truths, and the actual thing which is the table is not, strictly speaking, known to us at all. We know a description, and we know that there is just one object to which this description applies, though the object itself is not directly known to us. In such a case, we say that our knowledge of the object is knowledge by description. (Russell, 1912b, p. 26)

It seems to me that the expression (table) and description (causing such and such sense-data) are connected to the assumed physical thing rather than the content of the expression of table would mean the same as the content of the sense-data concepts. A physical thing is not reducible to "such-and-such sense-data" in the sense that the concept of table could be said in a more fundamental way in terms of sense-data. The inferred entities can be substituted for these ordinary thing concepts (ta-

ble), but not the sense-data concepts. The difference between sense-data and the external physical thing is manifested throughout the writings of Russell.

According to Russell, the particulars, which we perceive, experience, apprehend, remember, or reason, are dependent on us. These particulars are our thoughts, feelings, ideas, and objects of sense. They are neither embodied external objects appearing to our vision, nor sensible qualities or events, such as a collapsing house. Russell describes:

> When I see a colour or hear a noise, I have direct acquaintance with the colour or the noise. (Russell, 1911b, pp. 148–9)

He continues in the same way:

> In the first place, our sense-data are only known to exist while our sensations last. The colour which I see when I look at an object is not known to be still then when I shut my eyes. (Russell, 1912a, p. 85)

Furthermore, according to Russell, the sense-data are not *mental* due to their dependence on the sense organs, nerves, and the brain:

> I regard sense-data as not mental, and as being, in fact, part of the actual subject-matter of physics. There are arguments, shortly to be examined, for their subjectivity, but these arguments seem to me only to prove physiological subjectivity, i.e. causal dependence on the sense organs, nerves, and brain. The appearance which a thing presents to us is causally dependent upon these, in exactly the same way as it is dependent upon intervening fog or smoke or coloured glass. (Russell, 1914, p. 7)

In addition, his letter tells in 1915:

> ..., for I hold strongly that the sense-datum is not mental – indeed my whole philosophy of physics rests upon the view that the sense-datum is purely physical. The fact of being datum is mental, but a particular which is a datum is not logically dependent upon being a datum. A particular which is a datum does, however, appear to be causally dependent upon sense-organs and nerves and brain. (Russell, 1915b, p. 88)

I understand that, in Russell's thoughts, this dependence involves the distinction between the sense-data and the external physical things because the external physical things cannot depend on the brain: physiological things are not physical things outside of physiological bodies. Therefore, we can conclude with exceptionally good reasons that the content of the physical object concepts does not mean the same as the content of the concepts of sense-data. But they can be substituted for the

external physical things in a way that the truth value of the same description remains the same even if the subject of the description switches from the physical object concept to an ordinary thing concept. Like we discovered above, the supposed inferred entities, i.e. the external physical things, should be substituted for the logical constructions, and Russell's theory clearly stated the non-identity between the sense-data and the physical things. The external physical thing such as a house is not causally dependent upon the sense-organs, nerves, and brain, which is self-evident.

Belief in external things, argued Russell, is a speculative hypothesis. In other words, one only has the direct experience of entities that Russell called "sense-data". He used the name "particular" of them. (Russell, 1914, pp. 5, 6, 7, 8, 9)

> When I speak of a 'sense-datum', I do not mean the whole of what is given in sense at one time. I mean rather such a part of the whole as might be singled out by attention: particular patches of colour, particular noises, and so on (Russell, 1914, p. 6).

More exactly, he meant as follows:

> Logically a sense-datum is an object, a particular of which the subject is aware (Russell, 1914, p. 9).

One logically derives from sense-data the external things (if there are any), although most people believe they describe the external material world in words (Russell, 1912a, pp. 80, 83; 1914, pp. 5, 6). However, in some sense, Russell did suggest identifying the appearances and the real thing on grounds of the principle of Occam's razor: "We should identify the thing with the class of its appearances" (Russell, 1914, pp. 9, 10, 11). Whether this suggestion means that we should use the ordinary thing concepts like "tomato" or "house" in referring to the external physical thing is one possibility: an ordinary thing concept would be the construction and description of an external physical thing, which would be about a bundle of sense-data. From the first-person point of view, the interesting point is a belief, which is not Russell's assumption, that the room is an appearance, but other people in the room are not appearances: "If a man were to sit down between two others, the appearance which the room would present to him…" (Russell, 1914, p. 10). I consider the two others to also be appearances from the first-person point of view. Moreover, a man is the appearance to two others from their own points of view because the whole room with other people is the appearance.[2] It is, therefore, and Russell (1912b, pp. 9–10) did not claim so, contradictory to claim that I am directly aware of another person in perception but am not directly aware of the table next to her. The

[2] In fact, in 1912, Russell knew well that other observers can only be inferred from the sense-data. See Russell, 1912b, pp. 9–10, 86.

red shape looks to be a table. Both are *sense-data* which I am aware of. From this fact—it is directly obvious I am aware of something—I cannot deductively infer that the facts of the external world are directly obvious or evident to me in a similar way. Before we go to the final section, we could consider for a moment what it is that we have found about the statement "Matter is a logical construction of sense-data".

According to Russell, matter is nothing but a logical construction of sensible particulars. If we have acquaintance only with sense-data of which we are directly aware (Russell, 1912b, p. 25), but we do not have acquaintance with matter, then the contents of the physical object concepts and the contents of the sense-data concepts cannot refer to the sense-data such as to "rumbling sounds" and "collapsing shapes". For example, when we perceive brownness, hardness, the size of a shape, or an aspect of the appearance, the unity of the object is formed from these sense-data. In Russell's argument, the construction "house", derived logically from a bundle of the sense-data, would be identified with a material body x about which we have a verbal description, such as "x collapses crashing into the ground". Both the logical construction "house" and the material body can replace x in the description *salva veritate*. However, an object, such as a house, cannot be reduced to features such as to sounds and shapes. Sense-data appear to be features in Russell's examples. Russell describes the *relationship* between a physical object and a perceptual sense-datum as follows:

> We may succeed in actually defining the objects of physics as functions of sense-data. (Russell, 1914, p. 5)

He also describes matter:

> The only justification possible must be one which exhibits matter as a logical construction from sense-data.... (Russell, 1915a)

If a logical construction means reducibility, then the relation reducibility is *not* identity unless our propositional function is identity such as "x is identical to y", in which x is a sense-datum leading to an object of physics, y. If our propositional function is, for example, "X is T", in which "T" means "tomato", and if we put in place of X a bundle of the sense-data, a true identity statement does not follow. It does not follow because the physical thing, say the tomato, is not identical to the bundle of the sense-data in Russell's theory: he exactly stated that the sense-data are physical entities that are caused by our sense-organs and brains. Matter, houses, and tomatoes, no doubt, are *not* caused by our sense-organs and brains. This also means that statements about the physical world do not mean the same as statements about sense-data. Russell did not think that an inference could be

made from a perceptual sense-datum to a physical thing, but the physical thing is constructed together by means of sensory particulars, forming a bundle of colors, sizes, and shapes:

> A complete application of the method which substitutes constructions for inferences would exhibit matter wholly in terms of sense-data, and even, we may add, of the sense-data of the single person, since the sense-data of others cannot be known without some element of inference. (Russell, 1914, p. 12)

Therefore, because we do not have acquaintance with both sense-data and physical things and because both the logical constructions and the sense-data cannot be substituted for the supposed physical things, the physical things and the sense-data are not identical in Russell's theory. It can be stated that colors, noises, touches, smells, and tastes are natural signs that inform us and refer to external physical entities (Russell, 1912b, p. 6). The result, thus, is that the contents of the sense-data statements are *not* also the contents of the statements of the physical world.

The result in this section is therefore that matter and the sense-data as entities are not identical in Russell's theory, and hence the contents of the physical object concepts and the contents of the sense-data concepts do not mean the same thing. Russell did not conclude this argument on the ground of observation. The methods that Russell used are obviously reasoning and introspection. These methods can be easily recognized in the first chapter of *The Problems of Philosophy*, for example. Russell used the arguments from illusion and perceptual relativity in order to argue for the distinction between the sense-data and the external physical things. (Russell, 1912b, pp. 1–6) However, we cannot discover and observe by means of these methods *the causal chain* between the external physical things, the perceiver's body and the sense-data. Russell's most important evidence for the existence of sense-data is, nonetheless, a causal dependence: the sense-data are physical particulars located within a perceiver. In the following pages, we will find out where Russell's conclusions take us.

4. The Contents of the Sense-data Statements Are Not Equivalent to the Contents of the Statements of the Physical World

In the preceding sections, we found plausible reasons to believe that Russell did not consider the "logical construction of sense-data" to mean that "The contents of the sense-data statements are the contents of the statements of the physical world". These statements have neither the same meaning nor a single reference in Russell's theory of perception. Furthermore, I will also show that, in gen-

eral, the sense-data of rumbling sounds and collapsing shapes and a real collapsing house are not identical because no things have opposite properties at the same time, such as being caused by the brain *and* not being caused by the brain. Let us first summarize what we have learned from sense-data, which, by the way, have been replaced by the object view of perception in the philosophy of perception of the beginning of the 21st century.

Russell argued about the sense-data as follows:

1) The sense-data are dependent on the sensory organs and the brain of the perceptive organism, and houses and tables are not dependent, which is self-evident.
2) The sense-data are known by acquaintance and the physical objects by description.
3) There is correlation between the sense-data and physical energy according to Russell, but correlation is not identity, which is self-evident.

Russell explained the difference between *logical* and *causal* dependence in his *Our Knowledge of the External World*. One thing can be logically dependent upon another when the other is part of the one. The existence of a book, for example, is logically dependent upon that of its pages: without the pages, there would be no book. The question of causal dependence is more difficult according to Russell. To know that one kind of thing is causally independent of another, we must know that it occurs without the other. Now it is obvious that, whatever legitimate meaning we give to the Self, our thoughts and feelings are causally dependent upon ourselves, or they do not occur when there is no Self for them to belong to. But in the case of objects of sense this is not obvious; indeed, as we saw, the common-sense view is that such objects persist in the absence of any percipient. If this is the case, then they are causally independent of ourselves; if not, not. (Russell, 1913b, pp. 81–82) However, like I presented above in last section, Russell emphasizes that "A particular which is a datum does, however, appear to be causally dependent upon sense-organs and nerves and brain." (Russell, 1915b, p. 88) In 1914, he stated "The appearance which a thing presents to us is causally dependent upon these [the sense organs, nerves, and brain], in exactly the same way as it is dependent upon intervening fog or smoke or coloured glass." (Russell, 1914, p. 7) Therefore, the first premise is Russell's argument based on his writings. Following Russell's thinking, the conclusion thus is from these conditions that the real collapsing house is not the same as the sense-data of rumbling sounds and collapsing shapes.

Furthermore, a sense-data concept and the external physical thing concept cannot be interchangeable in a proposition as subjects so that the meaning of the proposition remains the same. For instance, if we have a propositional function "x is external", x cannot be both a sense-datum concept and the concept of house under the above conditions and therefore in Russell's sense-datum theory of perception. The analysis of Roderick M. Chisholm could clarify why the contents of the

statements of ordinary things and the contents of the statements of sense-data are not equivalent. He analyzed the relationship between the statements of ordinary things and the statements of sense-data in his article *The Problem of Empiricism*, published in 1948. Chisholm referred to C. I. Lewis' assertion that any statement which refers to a material thing may be fully conveyed in statements which refer to sense-data, or to the sensible appearances of things. For example, put Lewis, the ordinary thing statement "That is a door-knob" will show that the statement entails an unlimited number of statements referring to sense-data. Chisholm continued that sense-datum statements are the "analytic consequences" of an ordinary thing statement (Chisholm, 1948, p. 512). The problem, according to Chisholm, is that of showing the nature of this relation between ordinary thing statements and sense-datum statements, and the roots of this problem are in the relativity of sense perception (Chisholm, 1948, p. 512). Chisholm argued that a red appearance or a sense-datum depends partly on the thing and partly on the conditions under which it is observed, and a material thing will never be present. In summary, contrary to Lewis's assertion, neither do the sense-datum and the external physical thing can be identical *in general*, nor the same x in a proposition. This conclusion leads us to consider why the sense-datum would be both internal and external or be dependent on and independent of the perceiver who has it.

No thing has opposite properties, such as corporeal and incorporeal, independent and dependent, or internal and external. If the immediate object of perception is colored, then it is not colorless, which is self-evident. If the object is separate from the observer, then it is not united with the observer, which is obvious. When following Russell's reasoning, the sense-datum is a physical entity that is dependent on the brain and sense organs. Hence, it is internal and not independent, whereas the house and other things of the external world are independent; this means things that are independent of the observer. This thinking is completely logical. The argument is simple:

1) Contrary properties cannot coincide in one and the same thing simultaneously.
2) A thing cannot be dependent on the brain and independent of the brain (from 1).
3) For Russell, the sense-data of rumbling sounds and collapsing shapes are dependent on the brain.
4) A real collapsing house is independent of the brain.
5) Therefore, the sense-data of rumbling sounds and collapsing shapes and the real collapsing house are not identical because they can have no contrary properties (from 2, 3, and 4).

As I said earlier in this section, it seems to me that Russell considered sense-data dependent on the sensory organs and the brain of a person. They would not be causally independent in the sense that they occur when there is no person. Sounds and colors, and percepts generally, do not occur if there is no observer because only physical energy occurs like light, pressure, or sound waves. Therefore,

the contents of the sense-data concepts and the content of the concept of the real house cannot be in the same propositional function replacing x so that the truth value remains the same.

My conclusion is that “Matter is a logical construction of sense-data” does not mean that matter and the sense-data are equivalent. Matter cannot really be reduced to properties, that is, it cannot be explained more fundamentally in terms of perceptible features. They are not the same thing at all. Therefore, the contents of the sense-datum statements are not equivalent to the contents of the statements of the physical world in Russell's sense-datum theory of perception.

5. Conclusion

Based on Russell's reasoning about the sense-data, we can conclude that the sense-data and the physical entities of the external environment are not identical in Russell's theory of perception, and, therefore, the contents of the sense-datum statements are not equivalent to the contents of the statements of the physical world. The nature of the logical construction between the sense-data and the external physical things is more equivocal issue because Russell did not give clear examples of the logical constructions. The “logical construction of sense-data” does not imply that the external physical things are reduced to the sense-data in the sense that they are identical.

The question of the essence of objects of perceptual experience, on the other hand, has turned against Russell's theory of perception in contemporary philosophy of perception: the sense-datum view has been replaced with the object view. The question—what we immediately perceive is a physical object or a mind-dependent phenomenon—would have been resolved in favor of direct realism and intentional theories of perception. This thing, that is to say, the essence of the object of perceptual experience, is not quite that simple. The weakness of these two theories is that they are silent about the *subject* of perceptual experience. Secondly, they still claim that sense-datum is an object that has properties, such as green color, body shape, and sound. Russell, by contrast, took note of observational conditions, the observer's physiology, and physical energy, such as light and waves, that change immediately perceived objects and require the emergence of early stages of conscious perception. These preconditions are the merit of Russell's theory of perception, which is also relevant today.

Finally, I would like to say a few words about the essence of the sense-datum. Russell's examples and my own experience refer to the fact that the immediate object of perception is often a *feature*, such as varying colors and sounds, a silhouette of a certain shape, *not* a thing that have properties. What we immediately perceive would be the features caused by our bodies.

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